a second slip ring component, said second slip ring component comprising a second interface surface and at least one second dynamic interface component;

wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form a slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary, and said first and second dynamic interface components being positioned to interact with each other to communicate at least one signal across said slip ring boundary.

2. (Original) The slip ring apparatus of claim 1, wherein said first and second dynamic interface components are positioned to interact with each other to communicate at least one signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components.

3. (Original) The slip ring apparatus of claim 2, wherein said first slip ring component comprises a first slip ring component substrate and wherein said second slip ring component comprises a second slip ring component substrate, each of said first and second slip ring component substrates comprising a circular platter.

4. (Original) The slip ring apparatus of claim 2, wherein said first slip ring component comprises a first slip ring component substrate and wherein said second slip ring component comprises a second slip ring component substrate, at least one of first and second slip ring component substrates comprising a printed circuit board.

5. (Original) The slip ring apparatus of claim 2, wherein said first and second dynamic interface components comprise components of position sensor circuitry.

6. (Original) The slip ring apparatus of claim 5, wherein said first and second dynamic interface components each comprise tracks of intermittently-spaced conductive segments that form capacitive sensor components of a position sensor mechanism.

7. (Original) The slip ring apparatus of claim 2, wherein said at least one of first and second slip ring component substrates comprises a printed circuit board, said printed circuit board comprising position sensor circuitry.

8. (Original) The slip ring apparatus of claim 2, wherein said first slip ring component comprises a moving first slip ring component substrate; wherein said second slip ring component comprises a stationary second slip ring component substrate; and wherein said first and second dynamic interface components are positioned to interact with each other so as to communicate at least one signal across said slip ring boundary at the same time said moving first slip ring component is rotating about said axis of slip ring rotation relative to said stationary second slip ring component.

9. (Original) The slip ring apparatus of claim 2, wherein said first dynamic interface component comprises at least one of a conductive trace or a contact pad; and wherein said second dynamic interface component comprises a brush contact.

10. (Original) The slip ring apparatus of claim 1, wherein said first slip ring component comprises a printed circuit board and is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image

processing circuitry for said optical block, power conversion circuitry for said optical block, or a combination thereof.

11. (Original) The slip ring apparatus of claim 1, wherein said first and second dynamic interface components are positioned to interact with each other to communicate at least one signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components, said at least one signal comprising a forward or return optical block control signal, an optical block image signal, or an optical block power signal.

12. (Original) The slip ring apparatus of claim 1, wherein said first slip ring component comprises a printed circuit board and is configured to be coupled to a drive actuator so that said drive actuator is capable of imparting rotation to said first slip ring component relative to said second slip ring component; and wherein said printed circuit board of said first slip ring component comprises control circuitry for said drive actuator.

13. (Original) The slip ring apparatus of claim 1, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first and second housing components.

14. (Original) The slip ring apparatus of claim 3, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first second housing components and so that said first and second housing components form a slip ring housing around said fist and second slip ring components; wherein said first housing component

comprises a first circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

15. (Original) A slip ring apparatus, comprising:

a first slip ring component, said first slip ring component comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by said fist slip ring component substrate; and

a second slip ring component, said second slip ring component comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate;

wherein said first and second slip ring components are rotatably coupled together so that said first and second interface surfaces are disposed in mating facing relationship to form a slip ring boundary therebetween, and so that said first and second dynamic interface components are positioned to interact with each other to communicate at least one signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components.

16. (Original) The slip ring apparatus of claim 15, wherein said first and second dynamic interface components are positioned to interact with each other to continuously communicate said at least one signal across said slip ring boundary at the same time said at least one of said first and second slip ring components is rotating relative to said other of said first and second slip ring components.

17. (Original) The slip ring apparatus of claim 16, wherein said at least one signal at least one signal communicated across said slip ring boundary comprises a forward or return optical block control signal, an optical block image signal, or an optical block power signal.

18. (Original) The slip ring apparatus of claim 16, wherein each of said first and second slip ring component substrates comprise a printed circuit board; wherein said first slip ring component is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, or a combination thereof.

19. (Original) The slip ring apparatus of claim 18, wherein said at least one signal communicated across said slip ring boundary comprises multiple signals transmitted across said slip ring boundary, said multiple signals comprising a forward or return optical block control signal, a processed optical block image signal, and an optical block power signal.

20. (Original) The slip ring apparatus of claim 18, wherein said first slip ring is configured to be coupled to a drive actuator so that said drive actuator is capable of imparting rotation to said first slip ring component relative to said second slip ring

component; and wherein said printed circuit board of said first slip ring component further comprises control circuitry for said drive actuator.

21. (Original) The slip ring apparatus of claim 19, wherein said first slip ring component comprises a moving first slip ring component substrate; wherein said second slip ring component comprises a stationary second slip ring component substrate; and wherein said first and second dynamic interface components are positioned to interact with each other so as to communicate at least one signal across said slip ring boundary at the same time said moving first slip ring component is rotating relative to said stationary second slip ring component.

22. (Original) The slip ring apparatus of claim 21, wherein said first dynamic interface component comprises at least one of a conductive trace or a contact pad; and wherein said second dynamic interface component comprises a brush contact.

23. (Original) The slip ring apparatus of claim 22, wherein said first dynamic interface component comprises a first track of intermittently-spaced conductive segments, and wherein said second dynamic interface component comprises a second track of intermittently-spaced conductive segments; said first and second tracks of intermittently-spaced conductive segments being positioned to interact with each other without contacting to form a position sensor mechanism.

24. (Original) The slip ring apparatus of claim 23, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first and second housing components.

25. (Original) The slip ring apparatus of claim 24, wherein said first and second housing components form a slip ring housing around said fist and second slip ring components; wherein said first housing component comprises a first circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

26. (Original) The slip ring apparatus of claim 25, wherein said dynamic seal comprises a ferro-fluidic seal.

27. (Original) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a moving first slip ring component, said first slip ring component comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by said fist slip ring component substrate, and

a stationary second slip ring component, said second slip ring component comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate,

wherein said first and second slip ring components are rotatably coupled together so that said first slip ring component rotates relative to

said second slip ring component, so that said first and second interface surfaces are disposed in mating facing relationship to form a slip ring boundary therebetween, and so that said first and second dynamic interface components are positioned to interact with each other to continuously communicate at least one signal across said slip ring boundary at the same time said first slip ring component is rotating relative to said second slip ring component; and

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component.

28. (Original) The camera system of claim 27, further comprising a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component.

29. (Original) The camera system of claim 28, wherein said first drive actuator comprises a voice coil servo mechanism coupled between said first slip ring component and said optical block.

30. (Original) The camera system of claim 28, wherein each of said first and second slip ring component substrates comprise a printed circuit board; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, control circuitry for said first drive actuator, or a combination thereof.

31. (Original) The camera system of claim 28, wherein said at least one signal communicated across said slip ring boundary comprises multiple signals transmitted across said slip ring boundary, said multiple signals comprising a forward or return optical block control signal, a processed optical block image signal, and an optical block power signal.

32. (Original) The camera system of claim 28, wherein each of said first and second slip ring component substrates comprise a printed circuit board; and wherein said printed circuit board of said first slip ring component comprises control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, and control circuitry for said first drive actuator.

33. (Original) The camera system of claim 32, wherein said at least one signal communicated across said slip ring boundary comprises multiple signals transmitted across said slip ring boundary, said multiple signals comprising a forward or return optical block control signal, a processed optical block image signal, and an optical block power signal.

34. (Original) The camera system of claim 31, wherein each of said multiple signals is communicated across said slip ring boundary by at least one first dynamic interface component to at least one second dynamic interface component; wherein said first dynamic interface component comprises a conductive trace and said second dynamic interface component comprises a brush contact; and wherein said first and second dynamic interface components are positioned to continuously contact each other to communicate said at least one signal across said slip ring boundary at the same time said first slip ring component is rotating relative to said second slip ring component.

35. (Original) The camera system of claim 28, wherein said first dynamic interface component comprises a first track of intermittently-spaced conductive segments, and

wherein said second dynamic interface component comprises a second track of intermittently-spaced conductive segments; said first and second tracks of intermittently-spaced conductive segments being positioned to interact with each other without contacting to form a position sensor mechanism.

36. (Original) The camera system of claim 30, wherein said first dynamic interface component comprises a first track of intermittently-spaced conductive segments, and wherein said second dynamic interface component comprises a second track of intermittently-spaced conductive segments; said first and second tracks of intermittently-spaced conductive segments being positioned to interact with each other without contacting to form a position sensor mechanism.

37. (Original) The camera system of claim 28, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first and second housing components.

38. (Original) The camera system of claim 37, wherein said first and second housing components form a slip ring housing around said fist and second slip ring components; wherein said first housing component comprises a first circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

39. (Original) The camera system of claim 38, wherein said dynamic seal comprises a ferro-fluidic seal.

40. (Original) The camera system of claim 28, wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

41. (Original) The camera system of claim 28, wherein said second slip ring apparatus comprises:

a moving first slip ring component, said first slip ring component of said second slip ring apparatus comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by said fist slip ring component substrate of said second slip ring apparatus; and

a stationary second slip ring component, said second slip ring component of said second slip ring apparatus comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate of said second slip ring apparatus;

wherein said first and second slip ring components of said second slip ring apparatus are rotatably coupled together so that said first slip ring component of said second slip ring apparatus rotates relative to said second slip ring component of said second slip ring apparatus, so that said first and second interface surfaces of said second slip ring apparatus are

disposed in mating facing relationship to form a slip ring boundary of said second slip ring apparatus therebetween, and so that said first and second dynamic interface components of said second slip ring apparatus are positioned to interact with each other to continuously communicate at least one signal across said slip ring boundary of said second slip ring apparatus at the same time said first slip ring component of said second slip ring apparatus is rotating relative to said second slip ring component of said second slip ring apparatus; and

wherein said optical block is coupled to said second slip ring apparatus so that it rotates with said first slip ring component of said second slip ring apparatus relative to said second slip ring component of said second slip ring apparatus, said first slip ring component of said second slip ring apparatus being coupled between said optical block and said second slip ring component of said second slip ring apparatus.

42. (Original) A method of communicating at least one signal across a slip ring boundary, comprising:

providing a slip ring apparatus, comprising:

a first slip ring component, said first slip ring component comprising a first interface surface and at least one first dynamic interface component, and

a second slip ring component, said second slip ring component comprising a second interface surface and at least one second dynamic interface component,

wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary, and said first and second dynamic interface components being positioned to interact with each other to communicate at least one signal across said slip ring boundary;

rotating at least one of said first and second slip ring components about said axis of slip ring rotation relative to the other of said first and second slip ring components; and

using said first and second dynamic interface components to communicate said at least one signal across said slip ring boundary simultaneously with said rotation.

43. (Original) The method of claim 42, wherein said first and second dynamic interface components comprise components of position sensor circuitry, and wherein said method further comprises using said first and second dynamic interface components to sense a position of said first slip ring component relative to said second slip ring component using .

44. (Original) The method of claim 42, further comprising rotating said first slip ring component while holding said second slip ring component stationary.

45. (Original) The method of claim 42, wherein said first dynamic interface component comprises at least one of a conductive trace or a contact pad; and wherein said second dynamic interface component comprises a brush contact.

46. (Original) The method of claim 42, wherein said first slip ring component comprises a printed circuit board; wherein said method further comprises providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component, and rotating said optical block with said first slip ring component; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, or a combination thereof.

47. (Original) The method of claim 42, wherein said first slip ring component comprises a printed circuit board; and wherein said method further comprises:

providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component;

rotating said optical block with said first slip ring component; and

controlling said optical block at least in part using circuitry of said printed circuit board, or processing image data from said optical block at least in part using circuitry of said printed circuit board, or providing power for said optical block at least in part using circuitry of said printed circuit board, or a combination thereof.

48. (Original) The method of claim 42, wherein said method further comprises providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component, and rotating said optical block with said first slip ring component; and wherein said at least one signal comprises a forward or return optical block control signal, an optical block image signal, or an optical block power signal.

49. (Original) The method of claim 42, wherein said first slip ring component comprises a printed circuit board; and wherein said method further comprises:

providing a drive actuator coupled to said first slip ring component;

using said drive actuator to rotate said first slip ring component relative to said second slip ring component; and

controlling said drive actuator at least in part using circuitry of said printed circuit board.

50. (Original) The method of claim 49, wherein said method further comprises:

providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component;

using said drive actuator to rotate said first slip ring component and said optical block relative to said second slip ring component; and

controlling said optical block at least in part using circuitry of said printed circuit board, or processing image data from said optical block at least in part using circuitry of said printed circuit board, or providing power for said optical block at least in part using circuitry of said printed circuit board, or a combination thereof.

51. (Original) The method of claim 42, further comprising providing a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first and second housing components.

52. (Original) The method of claim 42, wherein said first slip ring component comprises a first slip ring component substrate and wherein said second slip ring component comprises a second slip ring component substrate, each of said first and second slip ring component substrates comprising a circular platter; and wherein said method further comprises:

providing a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first second housing components and so that said first and second housing components form a slip ring housing around said fist and second slip ring components;

wherein said first housing component comprises a first circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and

wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

53. (New) A slip ring apparatus, comprising:

a first slip ring component, said first slip ring component comprising at least two first dynamic interface components; and

a second slip ring component, said second slip ring component comprising at least two second dynamic interface components;

wherein said first slip ring component is coupled to circuitry configured to generate a differential serial digital signal;

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said differential serial digital signal across said slip ring boundary.

54. (New) The slip ring apparatus of claim 53, wherein said differential serial digital signal comprises a differential serial digital video signal.

55. (New) The slip ring apparatus of claim 53, wherein said first slip ring component comprises a first interface surface, and said second slip ring component comprises a second interface surface; wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary; and wherein said first and second dynamic interface components are positioned to interact with each other to communicate said differential serial digital signal across said slip ring boundary ring at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components.

56. (New) A method of communicating at least one signal across a slip ring boundary, comprising:

providing a slip ring apparatus, comprising:

a first slip ring component, said first slip ring component comprising at least two first dynamic interface components, and

a second slip ring component, said second slip ring component comprising at least two second dynamic interface components,

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate at least one signal across said slip ring boundary;

rotating at least one of said first and second slip ring components to the other of said first and second slip ring components; and

using said first and second dynamic interface components to communicate a differential serial digital signal across said slip ring boundary simultaneously with said rotation.

57. (New) The method of claim 56, wherein said differential serial digital signal comprises a differential serial digital video signal.

58. (New) The method of claim 56, wherein said first slip ring component comprises a first interface surface, and said second slip ring component comprises a second interface

surface; wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary; wherein said first and second dynamic interface components are positioned to interact with each other to communicate said differential serial digital signal across said slip ring boundary ring at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components; and wherein said rotating comprises rotating at least one of said first and second slip ring components about said axis of slip ring rotation relative to the other of said first and second slip ring components.